

Application No. 10/518,845
Amtd. Dated: March 30, 2009
Reply to Office Action Dated: January 6, 2009

REMARKS/ARGUMENTS

The Examiner is thanked for the Office Action mailed January 6, 2009. The status of the application is as follows:

- Claims 1-21 are pending, claims 7 and 11 has been amended, claim 13 has been cancelled, and claims 16-21 have been added;
- Claims 11, 12, 14, 15 are rejected under 35 U.S.C. 101 as being directed to non-statutory subject matter;
- Claims 1-6, 7, 8-12, 13, 14, 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mataxas et al. (US 6,295,464 B1) in view of Ryals et al. (US 5,803,914).

The objections and rejections are discussed below.

The Rejection under 35 U.S.C. 101

Claims 11, 12, 14, 15 stand rejected under 35 U.S.C. 101. In particular, the Office asserts that the claims do not fall within one of the four statutory categories of invention. This rejection should be withdrawn as the claims have been amended in accordance with the Examiner's suggestion.

The Rejection of Claims 1-6, 7, 8-12, 13, 14, 15 under 35 U.S.C. 103(a)

Claims 1-6, 7, 8-12, 13, 14, 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Metaxas et al. in view of Ryals et al. This rejection should be withdrawn because the combination of Metaxas et al. and Ryals et al. does not establish a *prima facie* case of obvious with respect to the subject claims.

The rationale to support a conclusion that the claim would have been obvious is that all the claimed elements were known in the prior art and one skilled in the art could have combined the elements as claimed. *KSR International Co. v. Teleflex Inc.*, 550 U.S. ____ (2007). MPEP §2143.

"To support the conclusion that the claimed invention is directed to obvious subject matter, either the references must expressly or impliedly suggest the claimed invention or the examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of

the teachings of the references." *Ex parte Clapp*, 227 USPQ 972, 973 (Bd. Pat. App. & Inter. 1985). MPEP §706.02(j).

Independent **claim 1** recites an image processing system for displaying information relating to the amplitude of displacements of wall regions of a deformable 3D object under study, the system comprising, *inter alia*: ***processing means for processing the 3D object data in the images of the sequence for locating the 3D object wall by defining regions of interest*** on the 3D object wall and processing the image data of the 3D object wall to ***determine the amplitude of displacement of each of said regions of interest as a function of time***. The processing means further ***construct a first 2D simplified representation of the 3D object wall by projection of the 3D object wall along an axis***, with the projections of the regions of interest in said 2D simplified representation. The combination of Metaxas et al. and Ryals et al. fail to teach or suggest the above-recited claim elements.

Metaxas et al. generally discloses a method for dynamically modeling an object from a first model to a second model. The provided volumetric model is adapted to the second model by altering parameters that represent rotation or deformation, in particular, by calculating force values that represent the physical motion between the first model and the second model. The force values are calculated using a plurality of signals received from a sensor. The signals themselves represent points that are ascertained using an ultrasound mapping technique.

The Office asserts that Metaxas et al. at Figure 4 teaches processing means for processing the 3D object data in the images of the sequence for locating the 3D object wall by defining regions of interest on the 3D object wall. Applicants respectfully disagree.

Figure 4 of Metaxas et al. instead discloses an instance where tagged material data points are limited and spaced far apart in the dynamic model (see column 9, lines 48-50). Material points are tagged in Metaxas by locally perturbing the magnetization in tissues to create spatially encoded patterns, which are visualized as dark points within the model (see column 2, lines 55-61). Where the tagged points are sparse, the model can be tessellated, or more simply, elements 201-203 can be juxtaposed to create uniform discrete volumes for the entire model surface, i.e., visually uniform data distribution (see column 9, lines 44-52). Metaxas is silent regarding *locating the 3D object wall* by defining regions of interest in the 3D object wall. Instead, Metaxas discloses tessellating data points within a model. The Office has failed to establish a

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prima facie case of obviousness because it has not explained how Metaxas discloses *locating the 3D object wall*, as claimed.

The Office further asserts that Figure 6 of Metaxas et al. teaches processing the image data of the 3D object wall to determine the amplitude of displacement of each of the said regions of interest as a function of time. Again, Applicants respectfully disagree.

Metaxas et al. instead discloses calculating force values for each material point P by: (1) approximating each boundary triangular element with a plane 223; (2) determining the element 223 whose distance from P, 220, is minimum; and (3) computing the intersection point Q, 221 (see column 9 line 65 to column 10, line 3). Metaxas et al. fails to teach determining an amplitude of displacement for each of the regions of interest as a function of time, as recited within claim 1.

Lastly, the Office asserts that Figures 9a-c of Metaxas et al. teach constructing a first 2D simplified representation of the 3D object wall by projection of the 3D object wall along an axis, with the projections of the regions of interest in the 2D simplified representation. Figures 9a-c of Metaxas et al. discloses examples of changing the dynamic model to a second model based on the change in position of the left ventricle. Figures 9a-b show the case where the length of the left ventricle is 10cm and 8cm, the origin of the model frame 300 is at the half-way point along the LV, and the origin of model frame 301 would to globally translate 1cm, i.e., a relatively uniform longitudinal contraction from apex to base of the left ventricle (see column 12, lines 50-58). Metaxas does not disclose *constructing a 2D simplified representation by projecting the 3D object wall along an axis*, as recited in claim 1.

Ryals et al. fails to make up for these deficiencies. Accordingly, the rejection of claim 1 should be withdrawn.

Claim 11 recites aspects similar to those recited in claim 1. As such, the arguments made with respect to claim 1 apply *mutatis mutandis* to claim 11. Hence, the rejection of claim 11 should be withdrawn.

Claims 2-10, 12-14 and 15 depend from claims 1 and 11, respectively, and are allowable at least by virtue of their dependencies. As such, the rejections of claims 2-10 and 12-15 should be withdrawn.

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New Claims 16-20

Newly added claims 16-20 emphasize various aspects. No new matter has been added. The art of record does not teach or suggest these aspects and claims 16-20 include aspects similar to those recited in claims 11 and 12, respectively, so the arguments made previously with regards to claims 11 and 12 also apply for claims 16-20. Entry and allowance of claims 16-20 is respectfully requested.

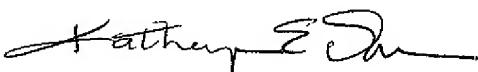
Cancelled Claims

Claim 13 has been cancelled herein without prejudice or disclaimer. As such, the rejection of claim 13 is moot. It is noted that applicants have cancelled claim 13 from further consideration in this application not for issues of patentability, but for facilitating expeditious prosecution of the application. Applicants are not conceding in this application that the cancelled claim is not patentable over the art cited by the Examiner. Applicants respectfully reserve the right to pursue the cancelled claim and/or other claims in one or more continuations and/or divisional patent applications.

Conclusion

In view of the foregoing, it is submitted that the claims distinguish patentably and non-obviously over the prior art of record. An early indication of allowability is earnestly solicited

Respectfully submitted,



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